

I Claim:

1. A method for performing a startup session to establish a communication session between a first communication system and a second communication system, comprising:

5 initiating a start-up procedure by one of the first communication system and the second communication system;

10 having the first communication system acknowledge one of a full-duplex operating mode and a half-duplex operating mode in response to a request by the second communication system; and

15 having the first communication system establish one of the full duplex operating mode and the half duplex operating mode for further communication that is compatible with a mode requested by the second communication system.

2. The method of claim 1, the first communication system comprising a central office system, the second communication system comprising a remote system.

20 3. The method of claim 1, wherein the first communication system and the second communication system each support an xDSL communication session.

4. The method of claim 1, wherein initiating a start-up procedure comprises initiating a start-up procedure for a high speed xDSL communication session.

25 5. The method of claim 1, further comprising establishing a low-speed communication session if a high-speed communication can not be established.

6. The method of claim 5, wherein establishing the low-speed communication session comprises establishing an analog communication session.

7. The method of claim 1, wherein initiating the start-up procedure by one of the first communication system and the second communication system

comprises having one of the first communication system and the second communication system transmit a signal from at least one predetermined set of signal families.

5           8. The method of claim 7, further comprising reversing a phase of the transmitted signal at predetermined time intervals.

10          9. A method for performing a startup session to establish one of a full duplex communication and a half duplex communication between a first communication system and a second communication system, comprising:

15          initiating a communication session by one of the first communication system and the second communication system in one of a full duplex operating mode and a half duplex operating mode;

20          issuing a request for the communication session to be established in one of the full duplex operating mode and the half duplex operating mode, the request being issued by the second communication system; and

25          completing the initialization of the communication session by having the first communication system use one of the full duplex operating mode and the half duplex operating mode that is compatible with a mode requested by the second communication system.

10. The method of claim 9, the first communication system comprising a central office system, the second communication system comprising a remote system.

11. The method of claim 9, wherein the first communication system and the second communication system each support an xDSL communication session.

25          12. The method of claim 9, wherein initiating a start-up procedure comprises initiating a start-up procedure for a high speed xDSL communication session.

13. The method of claim 9, further comprising establishing a low-speed communication session if a high-speed communication can not be established.

5           14. The method of claim 13, wherein the low-speed communication session comprises a communication session occupying an approximate 4 kHz bandwidth.

10           15. The method of claim 9, wherein initiating the communication session comprises having one of the first communication system and the second communication system transmit a signal from at least one predetermined set of signal families.

15           16. The method of claim 15, further comprising reversing a phase of the transmitted signal at predetermined time intervals.

20           Sub 17. A method for performing a startup session to establish a high speed communication session, comprising:

25           having a first communication system transmit a predetermined signal to a second communication system, the first communication system and the second communication system both supporting a half duplex operating mode;

             detecting the predetermined signal at the second communication system, the second communication system responding to the first communication system by transmitting a selected signal;

30           halting, for a predetermined time period, the transmission of the predetermined signal by the first communication [remote] system when the selected signal is detected by the first communication system, a second predetermined signal, indicating a half duplex operating mode, being transmitted by the first communication system upon an expiration of the predetermined time period, the second communication system stopping the transmission of the selected signal upon detection of the second predetermined signal; and

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acknowledging the half-duplex mode by the second communication system by the turning OFF of the selected signal, so that a high speed half-duplex mode communication session is established.

5        18. The method of claim 17, the first communication system comprising a remote system, the second communication system comprising a central office system.

10        19. The method of claim 17, wherein the first communication system and the second communication system each support a high speed xDSL communication session.

15        *SuBj* 20. The method of claim 17, wherein having the first communication system transmit the predetermined signal comprises transmitting the predetermined signal from at least one signal family.

21. The method of claim 20, further comprising reversing a phase of the predetermined signal at predetermined intervals.

15        22. The method of claim 17, further comprising having the first communication system re-transmit the second predetermined signal when the half-duplex mode is not acknowledged by the second communication system, so as to re-try establishing the high-speed half-duplex mode communication session.

20        23. The method of claim 17, further comprising establishing a low-speed communication session if a high-speed half-duplex mode communication session can not be established.

25        24. The method of claim 23, wherein the low-speed communication session comprises a communication session occupying an approximate 4 kHz bandwidth.

25        25. A method for performing a startup session of a high speed communication session, comprising

having a first communication system transmit a predetermined signal to a second communication system, the first communication system supporting only a half duplex operating mode while the second communication system supports only a full duplex operating mode;

5           detecting the predetermined signal at the second communication system, the second communication system responding to the first communication system by transmitting a selected signal;

10           halting, for a predetermined time period, the transmission of the predetermined signal when the selected signal is detected by the first communication system, a second predetermined signal, indicating a half duplex operating mode, being transmitted by the ~~first~~ communication system upon an expiration of the predetermined time period; and

15           detecting, by the first communication system, that the second communication system continues to transmit the selected signal during the time when the second predetermined signal should have been detected, the first communication system concluding that a high speed half duplex operating mode can not be established between the first communication system and the second communication system.

20           26. The method of claim 25, the first communication system comprising a remote system, the second communication system comprising a central office system.

25           27. The method of claim 25, wherein the first communication system and the second communication system each support a high speed xDSL communication session.

28. The method of claim 25, further comprising establishing a low-speed communication session if the high-speed half duplex operating mode can not be

established.

29. The method of claim 28, wherein the low-speed communication session comprises a communication session occupying an approximate 4 kHz bandwidth.

5       30. The method of claim 25, further comprising having the first communication system transmit a termination signal to terminate the startup session when the high speed half duplex operating mode can not be established.

10      31. A method for performing a startup session of a high speed communication, comprising:

15      having a first communication system transmit a first predetermined signal to a second communication system, the first communication system supporting only a full duplex operating mode while the second communication system supports only a half duplex operating mode;

20      detecting the predetermined signal at the second communication system, the second communication system responding to the first communication system by transmitting a selected signal;

25      halting, for a predetermined time period, the transmission of the predetermined signal when the selected signal is detected by the first communication system, a second predetermined signal, indicating a full duplex operating mode, being transmitted by the first communication system upon an expiration of the predetermined time period; and

25      determining, by the first communication system, that the second communication system has stopped transmitting the selected signal after the second predetermined signal is transmitted, the first communication system concluding that a high speed full duplex operating mode can not be established between the first communication [remote] system and the second communication

system.

32. The method of claim 31, the first communication system comprising a remote system, the second communication system comprising a central office system.

5           33. The method of claim 31, wherein the first communication system and the second communication system each support a high speed xDSL communication session.

10           34. The method of claim 31, further comprising establishing a low-speed communication session if the high speed full duplex operating mode can not be established.

15           35. The method of claim 34, wherein the low-speed communication session comprises a communication session occupying an approximate 4 kHz bandwidth.

20           36. The method of claim 31, further comprising having the first communication system transmit a termination signal to complete the startup session when the high speed full duplex operating mode can not be established.

25           37. A method for performing a startup session of a high speed communication, comprising:

having a central system transmit a predetermined signal to a first communication office system, the first communication system and the second communication system both supporting a half duplex operating mode;

detecting the predetermined signal at the first communication system, the first communication system responding to the second communication system by transmitting a selected signal, indicating a half duplex mode, to the second communication system;

halting, for a predetermined time period, the transmission of the

predetermined signal when the selected signal is detected by the second communication system, a second predetermined signal, indicating a half duplex operating mode, being transmitted by the first communication system to the second communication system; and

5 acknowledging the half-duplex mode by the second communication system, so that a high speed half-duplex mode communication session is established.

38. The method of claim 37, the first communication system comprising a remote system, the second communication system comprising a central office system.

10 39. The method of claim 37, wherein the first communication system and the second communication system each support a high speed xDSL communication session.

15 40. A method for performing a startup session of a high speed communication between a first communication system and a second communication system, comprising:

20 having the second communication system transmit a predetermined signal to the first communication system, the first communication system supporting only a half duplex operating mode while the second communication system supports only a full duplex operating mode;

detecting the predetermined signal at the first communication system, the first communication system responding to the second communication system by transmitting a selected signal indicating a half duplex operating mode; and

25 detecting, by the first communication office system, that the second communication system continues to transmit the predetermined signal after the selected signal is transmitted, the first communication system concluding that a

high speed half duplex operating mode can not be established between the first communication system and the second communication system.

41. The method of claim 40, the first communication system comprising a remote system, the second communication system comprising a central office system.

42. The method of claim 40, wherein the first communication system and the second communication system each support a high speed xDSL communication session.

43. The method of claim 40, further comprising establishing a low-speed communication session if the high speed half duplex operating mode can not be established.

44. The method of claim 43, wherein the low-speed communication session comprises a communication session occupying an approximate 4 KHz bandwidth.

45. The method of claim 40, further comprising having the first communication system transmit a termination signal to complete the startup session when the high speed half duplex operating mode can not be established.

46. A method for performing a startup session of a high speed communication, comprising:

having a central system transmit a predetermined signal to a first communication system, the first communication system supporting only a full duplex operating mode while the second communication system supports only a half duplex operating mode;

detecting the predetermined signal at the first communication system, the first communication system responding to the second communication system by transmitting a selected signal, indicating a full duplex mode, to the second

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communication system;

halting the transmission of the predetermined signal when the second communication system detects the selected signal transmitted by the first communication system; and

determining, by the first communication system, that the second communication system stopped transmitting the predetermined signal after the selected predetermined signal was transmitted, the first communication system concluding that a high speed full duplex operating mode can not be established between the first communication system and the second communication system.

47. The method of claim 46, the first communication system comprising a remote system, the second communication system comprising a central office system.

48. The method of claim 46, wherein the first communication system and the second communication system each support a high speed xDSL communication session.

49. The method of claim 46, further comprising establishing a low-speed communication session if the high speed full duplex operating mode can not be established.

50. The method of claim 49, wherein the low-speed communication session comprises a communication session occupying an approximate 4 KHz bandwidth.

51. The method of claim 46, further comprising having the first communication system transmit a termination signal to complete the startup session when the high speed full duplex operating mode can not be established.

52. The method of claim 17, further comprising having the first communication system re-transmit a third predetermined signal when the half-

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duplex mode is not acknowledged by the second communication system, so as to try establishing a full-duplex mode communication session.

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